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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/030,732	01/08/2002	Hideo Nakajima	SAEGU97.001APC	8246

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KNOBBE MARTENS OLSON & BEAR LLP
2040 MAIN STREET
FOURTEENTH FLOOR
IRVINE, CA 92614

EXAMINER	
KERNS, KEVIN P	

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 02/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/030,732	NAKAJIMA, HIDEO	
	Examiner	Art Unit	
	Kevin P. Kerns	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,8 and 10-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,8,10,12 and 14* is/are rejected.

7)☒ Claim(s) *11 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 8, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapovalov (US 5,181,549) in view of JP 5-59462, and further in view of JP 3-17236 (see Information Disclosure Statement of 4/2/02).

Shapovalov discloses a method for manufacturing porous metallic articles, in which the method includes the steps of melting a raw metal material, including copper, iron, nickel, magnesium, and various alloys (column 6, lines 62-68) under a wide range of pressures between 0.1 and 10 MPa, inclusive of pressures between 0.2 and 2.5 MPa (column 7, lines 3-13), such that the pressurization gas includes hydrogen gas (column 4, lines 27-61); and providing cooling while controlling gas pressure to the molten metal (after pouring into the mold) to enhance directional solidification in the mold inside the sealed vessel (autoclave 10) to form the cast metal porous body product (abstract; column 2, lines 42-68; column 3, lines 1-15 and 58-68; column 4, lines 1-68; column 5, lines 1-65; column 6, lines 46-68; column 7, lines 1-68; and Figures 1-8). Shapovalov does not specifically disclose the step of maintaining the raw metal material under a reduced pressure at a preheating temperature just below the melting point of the metal,

nor does Shapovalov disclose the use of nitrogen gas and/or one or more gases as pressurization gas/gases.

However, JP 5-59462 discloses a method of producing high purity copper, with the method including evacuating a high vacuum vessel to less than 10^{-3} torr pressure while heat treating/degassing the copper in a temperature range between 500 and 1,000 degrees Celsius (below the copper melting point) for more than 1 hour, for the purpose of degassing the metal, and thereby obtaining a high purity (copper) metal product (abstract).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method for manufacturing porous metallic articles, as disclosed by Shapovalov, by adding the step of operating at a reduced pressure at a preheating temperature just below the melting point of the metal, as taught by JP 5-59462, in order to degas the metal, and thereby obtain a high purity (copper) metal product (JP 5-59462; abstract).

Neither Shapovalov nor JP 5-59462 discloses the use of nitrogen gas and/or one or more gases as pressurization gas/gases.

However, JP 3-17236 discloses a method of manufacturing foamed metal, in which the method includes providing fine gas bubbles uniformly dispersed over the whole of the metal, in which the gas bubbles are created by a step of dissolving a soluble gas such as hydrogen and nitrogen into molten metal, for the purpose of obtaining a foamed metal in a uniform foaming state (abstract; and Figures 1-3).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method for manufacturing porous metallic articles, as disclosed by Shapovalov, by adding the step of operating at a reduced pressure at a preheating temperature just below the melting point of the metal, as taught by JP 5-59462, in order to degas the metal, and thereby obtain a high purity (copper) metal product, and by further using hydrogen and nitrogen as the pressurization gas to form the foamed metal, as disclosed by JP 3-17236, in order to obtain a foamed metal in a uniform foaming state (JP 3-17236; abstract).

3. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shapovalov (US 5,181,549) in view of JP 5-59462, and further in view of JP 3-17236, as applied to claim 1 above, and further in view of JP 3-294437.

Shapovalov (in view of JP 5-59462, and further in view of JP 3-17236) disclose and/or suggest the features of claim 1 above. Neither Shapovalov, JP 5-59462, nor JP 3-17236 specifically discloses that the casting is conducted by a continuous casting method.

However, JP 3-294437 discloses a method and apparatus for manufacturing porous metallic materials, in which the process includes continuously draining slurried porous metal 12 from a drain nozzle 3 to provide continuous casting in the mold below the molten metal 10 in the container, such that the continuously draining/casting of the porous metal is advantageous for continuously obtaining a porous metal product having a wide range of shapes and porosity (abstract; and Figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method for manufacturing porous metallic articles, as disclosed by Shapovalov, by adding the step of operating at a reduced pressure at a preheating temperature just below the melting point of the metal, as taught by JP 5-59462, in order to degas the metal, and thereby obtain a high purity (copper) metal product, by further using hydrogen and nitrogen as the pressurization gas to form the foamed metal, as disclosed by JP 3-17236, in order to obtain a foamed metal in a uniform foaming state, and by further using a continuous casting method, as disclosed by JP 3-294437, in order to continuously obtaining a porous metal product having a wide range of shapes and porosity (JP 3-294437; abstract).

Allowable Subject Matter

4. Claims 11 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or suggest a process for producing a porous metal body that includes all steps of independent claims 1 and 12, and further includes the use of a gas mixture comprising a nitrogen-argon mixture, a nitrogen-helium mixture, or a nitrogen-argon-helium mixture (dependent claims 11 and 13).

Response to Arguments

6. The examiner acknowledges the applicant's amendment and declaration under 37 CFR 1.132, both of which were received by the USPTO on November 19, 2004. The applicant's amendment has overcome prior objections to the drawings, abstract, specification, and claim 2. The applicant has also added new claims 11-14. Dependent claims 11 and 13 have been indicated as allowable subject matter (see paragraph 4 above). As a result, claims 1, 2, 8, and 10-14 are currently under consideration in the application.

7. Applicant's arguments with respect to claims 1, 2, 8, 10, 12, and 14 have been considered but are moot in view of the new ground(s) of rejection.

It is noted that the new reference (JP 3-17236) applied in paragraphs 2 and 3 above was listed in the Information Disclosure Statement dated April 2, 2002. As a result, a copy of this reference is not enclosed since it is already on record in the file.

Response to Amendment

8. The declaration under 37 CFR 1.132 filed November 19, 2004 is insufficient to overcome the rejection of claims 1, 2, 8, 10, 12, and 14, as set forth in the last Office action because of the new grounds of rejection set forth in paragraphs 2 and 3 above.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns Kevin Kerns 2/4/05
Examiner
Art Unit 1725

KPK
kpk
February 4, 2005